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EXAMINER

TIBBITS, PIA FLORENCE

ART UNIT

PAPER NUMBER

2838

DATE MAILED: 10/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/626,333

Applicant(s)

BURTON ET AL.

Examiner

Pia F Tibbits

Art Unit

2838

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 July 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 7/24/03.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☒ Other: revised dwg.

**DETAILED ACTION*****Drawings***

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the (detection of the) state-of-charge, the transistor, the relay, the mechanical switch, the first battery, the second battery, the second battery charging system simultaneously .... charging said first cell, the second cell being charged simultaneously with said charging of said first cell must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement-drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the examiner does not accept the changes, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Specification***

2. The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

3. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter: "selectively controlling the number of turns of said first secondary coil in response at least

Art Unit: 2838

in part to a state of charge of said at least one cell". See 37 CFR 1.75(d)(1) and MPEP § 608.01(o).

Correction is required.

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 5, 19-21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 5: the statement "one switch responsive to a control signal generated by said control circuit, said switch operable between a first position wherein a first voltage is applied from a first of said plurality of taps to said at least one cell, and a second position wherein a second voltage is applied from a second of said taps to said at least one cell" is confusing since there is no feedback shown in applicant's drawings describing to what input the processor activating the switch responds, i.e., input from the charging battery indicating a state-of-charge. Additionally, the selection of tapping into one voltage was done in claim 4, upon which claim 5 depends. To continue prosecution it was assumed the switch switches between the intermittent mode and the continuous mode using the charge mode set.

Claim 19: the statement "selectively controlling the number of turns of said first secondary coil in response at least in part to a state of charge of said at least one cell" is not clear since "in part to a state of charge of said at least one cell" is indefinite. What else is considered?

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2838

7. Claims 1-8, 10-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Mizutani et al.** [hereinafter Mizutani] [6756697] in view of **Bapat** [5786684].

Mizutani discloses a battery charging system for use with an induction charger, comprising a secondary coil 21a for receiving magnetic flux produced by a primary coil 17a of the induction charger 24, said secondary coil 17a having a plurality of turns/coils 21b, 21c, 21d; and a control circuit 24d for controlling charging of at least one cell 25a. Mizutani does not disclose specifically controlling a number of turns of said secondary coil. However, the patent discloses that coils 21b, 21c, 21d, connected to control circuit 24d, differ in the number turns included, and that the control circuit 24d selects one of the coils 21b, 21c, 21d based on the proper voltage to be applied to the rechargeable battery 25a, and then the proper voltage is applied to the rechargeable battery 25a [see also column 11, lines 62-67; column 12, lines 5-26].

Bapat discloses the amount of magnetic flux ( $f$ ) generated by a primary coil is proportional to the number of turns in the primary coil, and since the voltage produced on the output or secondary coil can be described as being generally proportional to the magnetic flux surrounding the secondary coil, the output voltage of a transformer is generally equal to the input voltage times the ratio of the number of turns in the input coil to the number of turns in the output coil. Consequently, by changing the ratio of input turns to output turns, output voltage can be changed or regulated. Tap changers operate according to this principle [see also column 1, lines 22-33]. Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to apply Bapat's teachings in Mizutani's apparatus, and use a coil with an appropriate number of turns in the secondary coil, as disclosed by Bapat, in order to change or regulate the output voltage to the battery to be charged.

As to claim 2, Mizutani discloses control circuit 24d controls a state of charge/voltage of cell/rechargeable battery 25a, and a charge current [see also column 12, lines 17-20].

As to claim 3, the secondary coil further comprising a plurality of taps, each of said taps providing an electrical connection to said secondary coil: it is an inherent function of Mizutani's and Bapat's

Art Unit: 2838

secondary coil to comprise a plurality of taps connecting to coils 21b, 21c, 21d, respectively, and MPEP 2100 states that the disclosure of a limitation may be expressed, implicit or **inherent**.

As to claim 4, a flow of time-varying electric current through said primary coil generates a voltage potential between at least two of said plurality of taps: it is an inherent function of Mizutani's and Bapat's apparatus to generate a voltage potential between at least two of said plurality of taps, i.e., and energize one of the coils 21b, 21c, 21d, respectively, and MPEP 2100 states that the disclosure of a limitation may be expressed, implicit or **inherent**.

As to claim 5, Mizutani discloses the user can change the charging scheme, which is automatically determined by the control circuit 24d of the battery charger 24, using the charge mode set switch SW3, if necessary. That is, the user can switch the battery charger 24 between the intermittent mode and the continuous mode using the charge mode set switch SW3. Further the user can adjust the switching frequency or the duty cycle using the charge mode set switch SW3. When the quantity of electricity supplied to the battery-powered device 25 reaches a predetermined value, the charge control circuit 24 ends the supply of electricity so that overcharge is prevented.

As to claim 6, using a transistor, a relay, and a mechanical switch, absent any criticality, is only considered to be the use of "optimum" or "preferred" material that a person having ordinary skill in the art at the time the invention was made using routine experimentation would have found obvious to provide for the switch disclosed by Mizutani and Bapat, since it has been held to be a matter of obvious design choice and within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use of the invention. See *In re Leshin*, 125 USPQ 416.

As to claim 7, the cell being contained within a battery: IEEE 7<sup>th</sup> edition defines a battery as a structure used to support a group of cells. Mizutani and Bapat do not disclose the control circuit contained within a battery-operated device. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to make integral the control circuit and the battery system, since it has been held that forming in one piece an article which has formerly been formed in two pieces

Art Unit: 2838

and put together involves only routing skill in the art. *Howard v. Detroit Stove Works*, 150 U.S. 164 (1893).

As to claim 8, Mizutani also discloses in fig.2 induction-charged battery operated devices including the secondary coil [see also column 3, lines 31-35]. Therefore, it is an inherent function of Mizutani's and Bapat's apparatus to have the secondary coil and the control circuit contained within a battery operated device, and MPEP 2100 states that the disclosure of a limitation may be expressed, implicit or **inherent**.

As to claims 10-12, see remarks for claims 1-8 above. Additionally, it would have been obvious to one having ordinary skill in the art at the time the invention was made to duplicate the battery charging system for use with an induction charger to other battery operated devices including a secondary coil, since it has been held that mere duplication of parts has no patentable significance unless a new and unexpected result is produced. *In re Harza*, 274 F.2d 669, 124 USPQ 378 (CCPA 1960) and MPEP 2144.04.

As to method claims 13-18, the method steps will be met during the normal operation of the apparatus described above.

8. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Mizutani and Bapat** in view of **Binder** [6208115].

Mizutani and Bapat disclose a battery charging system for use with an induction charger, comprising a secondary coil for receiving magnetic flux produced by a primary coil of the induction charger, said secondary coil having a plurality of turns; and a control circuit for controlling a number of turns of said secondary coil that are used in charging at least one cell, the secondary coil and the control circuit being contained within battery operated devices. Mizutani and Bapat do not disclose the cell is detachable from said battery operated device.

Binder discloses that a conventional rechargeable battery (10) containing at least one rechargeable cell (11) may be recharged via induction by means of a contactless charging unit (20), and

Art Unit: 2838

could be replaced [see also the abstract; column 4, lines 56-57]. Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to include Binder's teachings in Mizutani's and Bapat's apparatus and include a conventional rechargeable battery that could be replaced in order to better accommodate a user's needs.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

### ***Conclusion***

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art cited in PTO-892 and not mentioned above disclose related apparatus: **Chen** [6693403] discloses that primary currents I1a and I1b induce an alternating secondary voltage in a secondary coil 12b. The secondary voltage is higher than the battery voltage, and its value or magnitude depends upon the ratio of the **number of turns of the secondary coil 12b** to the number of turns between the center tap 20 to the first terminal 21, as well as the ratio of the number of turns of the secondary coil 12b to the number of turns between the center tap 20 to the second terminal 22. **Petkovic** [6037728] discloses an AC generator feeding the primary coil of a transformer whose **secondary coil can be tapped at one of a number of different turns**. Means are provided for changing the tap points so as **to increase the number of turns in the secondary**. The output from the secondary is fed to a rectifier and thereafter the direct current is fed to a battery energy storage device. By increasing the turns of the secondary, more energy can be fed and stored in the battery. **Ruegenberg et al.**



Art Unit: 2838

[5951735] discloses that the voltage ratio between a primary and a secondary side is--in a first approximation--determined by the ratio of the numbers of turns of the primary and secondary coils and is thus constant. The transmission ratio between the respective primary coil PR1 or, respectively, PR2 and the secondary coil SEK is expediently selected so that a significantly higher voltage compared thereto is generated at the secondary side. **Gali** [RE35643] discloses in fig.2 a charger 80 including transformer 16' having a primary coil 15' and a **secondary coil 17' with two intermediate taps** 81 and 82. A manually operated switch 83 has a switch arm 84 switchable between contacts 81C, for six volt battery charging, 82C, for twelve volt battery charging, and 85C for twenty four volt battery charging with contact 85C connected to the bottom end 85 of secondary coil 17'. **Bourke** [3938020] discloses the turns ratio relating the resonating inductors 35-1, 36-1 to their associated charging inductors 35-3, 36-3 is established to determine the conditions under which energy is delivered to a battery. In other words, the amp-turns in the resonating inductor are transferred to the charging inductor. Raising the number of turns in the charging inductor to limit current, has the effect of lengthening the period during which energy is delivered to the battery (the number of volt-seconds taken from the resonating winding must correspond to the number of volt-seconds delivered to the charging winding). **Asselman et al.** [5969511] discloses a method and a device for continuously adjusting, within a certain adjustment range, the turns ratio between the primary winding and the secondary winding of a power transformer provided with at least one regulating winding, a first tap is switched on during a portion of a cycle of the alternating voltage of the transformer and a second tap is switched on during another portion of the cycle of the alternating voltage. For this purpose, the device comprises electronic switches in the form of thyristors or transistors.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Pia Tibbits whose telephone number is (571) 272-2086. If unavailable, contact the Supervisory Patent Examiner Mike Sherry whose telephone number is (571) 272-2084. The Technology Center Fax number is (703) 872-9306.

Art Unit: 2838

12. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PFT

October 20, 2004

Pia Tibbits



Primary Patent Examiner